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(54) PROGRAM RECOMMENDING APPARATUS AND PROGRAM RECOMMENDING
METHOD AND RECODING MEDIUM WITH ITS PROGRAM RECORDED

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a program recommending apparatus and
method capable of executing program recommendation corresponding to the taste
characteristics of the program selection of a user and a recording medium for
recording its program.
SOLUTION: A plurality of profiles are generated by arbitrarily changing a profile value
according to the classification of the text of EPG data being the program information
of a television program, and programs to be recommended are decided and
recommended by using the plurality of generated profiles.

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CLAIMS

[Claim(s)]
[Claim 1] Program recommendation equipment characterized by to have a user taste study means to generate two or more profiles which profile attribute value was changed to arbitration and generated it, and a recommendation program decision means to determine a recommendation program using two or more profiles generated by this user taste study means, according to the classification of the text of the program information slack EPG data of a television program.
[Claim 2] Program recommendation equipment according to claim 1 characterized by having further a recommendation program display means to display the recommendation program determined by said recommendation program decision means.
[Claim 3] An EPG data control means by which said EPG data are managed, and a

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race card display means to display a race card based on the EPG data managed by this EPG data control means, It has further a program reservation means to reserve the program specified as the user. Said user taste study means The program in which the selection input was done by the user from the race card displayed by said race card display means, And program recommendation equipment according to claim 2 which acquires said EPG data of the program inputted into said program reservation means by said user from said EPG data control means, and is characterized by counting the frequency of occurrence of said text of the this acquired EPG data.

[Claim 4] Said user taste study means is program recommendation equipment according to claim 2 or 3 characterized by making the aggregate value of said profile into a different aggregate value according to the classification of said text.

[Claim 5] It is program recommendation equipment of the publication by any 1 term of claims 2-4 which carry out [that said recommendation program display means displays the list of the recommendation programs which the user was made to choose whether it puts among the classification of said text, emphasis is put on what, and said recommendation program is determined in case the list of said recommendation programs is displayed, and were determined by said recommendation program decision means using the profile according to this selection in it, and] as the description.

[Claim 6] Said recommendation program display means is program recommendation equipment given in any 1 term of claims 2-5 characterized by showing said text most contributed to the decision of said recommendation program for every one or plurality, and program in case the list of said recommendation programs is displayed.

[Claim 7] Said user taste study means is program recommendation equipment given in any 1 term of claims 1-6 characterized by using a program title as a text classification of said EPG data.

[Claim 8] Said user taste study means is program recommendation equipment given in any 1 term of claims 1-7 characterized by using a performer name as a text classification of said EPG data.

[Claim 9] Said user taste study means is program recommendation equipment given in any 1 term of 1 to 8 characterized by using the genre of a program as a text classification of said EPG data.

[Claim 10] The program recommendation approach characterized by having the user taste study process which generates two or more profiles which profile attribute value was changed to arbitration and generated it, and the recommendation program decision process of determining a recommendation program using two or more profiles generated by this user taste study process, according to the classification of the text of the program information slack EPG data of a television program.

[Claim 11] The program recommendation approach according to claim 10 characterized by having further the recommendation program display process which displays the recommendation program determined according to said recommendation

program decision process.

[Claim 12] Receive and said EPG data like the EPG data receiving tube science and engineering to manage The race card display process which receives like this EPG data receiving tube science and engineering, and displays a race card based on the EPG data managed, It has further the program reservation process which reserves the program specified as the user. Said user taste study process The program in which the selection input was done by the user from the race card displayed by said race card display process, And said EPG data of the program inputted into said program reservation process by said user are received like said EPG data receiving tube science and engineering. The program recommendation approach according to claim 11 characterized by acquiring from the managed EPG data constellation and counting the frequency of occurrence of said text of the this acquired EPG data.

[Claim 13] Said user taste study process is the program recommendation approach given in any 1 term of claims 11 or 12 characterized by making the aggregate value of said profile into a different aggregate value according to the classification of said text.

[Claim 14] It is the program recommendation approach of the publication by any 1 term of claims 11-13 carried out [that said recommendation program display process displays the list of the recommendation programs which the user was made to choose whether it puts among the classification of said text, emphasis is put on what, and said recommendation program is determined in case the list of said recommendation programs is displayed, and were determined according to said recommendation program decision process using the profile according to this selection in it, and] as the description.

[Claim 15] Said recommendation program display process is the program recommendation approach given in any 1 term of claims 11-14 characterized by showing said text most contributed to the decision of said recommendation program for every one or plurality, and program in case the list of said recommendation programs is displayed.

[Claim 16] Said user taste study process is the program recommendation approach given in any 1 term of claims 10-15 characterized by using a program title as a text classification of said EPG data.

[Claim 17] Said user taste study process is the program recommendation approach given in any 1 term of claims 10-16 characterized by using a performer name as a text classification of said EPG data.

[Claim 18] Said user taste study process is the program recommendation approach given in any 1 term of 10 to 17 characterized by using the genre of a program as a text classification of said EPG data.

[Claim 19] The record medium which recorded in the program characterized by to perform user taste study processing which generates two or more profiles which profile attribute value was changed to arbitration and generated it, and

recommendation program decision processing in_which a recommendation program is determined using two or more profiles generated by this user taste study processing, according to the classification of the text of the program information slack EPG data of a television program.

[Claim 20] The record medium which recorded the program according to claim 19 characterized by performing further recommendation program display processing which displays the recommendation program determined by said recommendation program decision processing.

[Claim 21] EPG data reception management processing in which said EPG data are received and managed, Race card display processing which receives by this EPG data reception management processing, and displays a race card based on the EPG data managed, Program reservation processing which reserves the program specified as the user is performed further. Said user taste study processing The program in which the selection input was done by the user from the race card displayed by said race card display processing, And said EPG data reception management processing receives said EPG data of the program inputted into said program reservation processing by said user. The record medium which recorded the program according to claim 20 characterized by acquiring from the managed EPG data constellation and counting the frequency of occurrence of said text of the this acquired EPG data.

[Claim 22] Said user taste study processing is the record medium which recorded the program of a publication on any 1 term of claims 20 or 21 characterized by making the aggregate value of said profile into a different aggregate value according to the classification of said text.

[Claim 23] It is the record medium recorded [term / of claims 20-22 which carry out / that said recommendation program display processing displays the list of the recommendation programs which the user was made to choose whether it puts among the classification of said text, emphasis is put on what, and said recommendation program is determined in case the list of said recommendation programs is displayed, and were determined by said recommendation program decision processing using the profile according to this selection in it, and / as the description / any 1] the program of a publication.

[Claim 24] Said recommendation program display processing is the record medium which recorded the program of a publication on any 1 term of claims 20-23 characterized by showing said text most contributed to the decision of said recommendation program for every one or plurality, and program in case the list of said recommendation programs is displayed.

[Claim 25] Said user taste study processing is the record medium which recorded the program of a publication on any 1 term of claims 19-24 characterized by using a program title as a text classification of said EPG data.

[Claim 26] Said user taste study processing is the record medium which recorded the

program of a publication on any 1 term of claims 19-25 characterized by using a performer name as a text classification of said EPG data.

[Claim 27] Said user taste study processing is the record medium which recorded the program of a publication on any 1 term of 19 to 26 characterized by using the genre of a program as a text classification of said EPG data.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the record medium which recorded the program recommendation equipment and the program recommendation approach of recommending the program according to a user's (program viewer) taste, and its program using the program information on a television program (EPG:Electronic Program Guide).

[0002]

[Description of the Prior Art] From the former, the taste to a user's program is judged from actuation of program viewing and listening of a user etc., and the system which recommends a program using the text information on EPG is known. For example, the profile which learned a user's taste as a result of the system indicated by JP,7-135621,A decomposing the EPG text information on the program which a user likes and accumulating a keyword that is, consisted of only one.

[0003]

[Problem(s) to be Solved by the Invention] However, by such approach, since all a user's taste is expressed with one profile, the program recommended by the profile will bring a monotonous result by which a user's taste was equalized. It is thought that the criteria which choose a user's program are originally of infinite variety. For example, if it is the program out of which specific performers (an actor, singer, etc.) have come if it is a specific program title like a serial drama and is to surely view and listen, it can be expected that there are also criteria of wanting to surely view and listen. Therefore, if the program recommendation according to the taste property of such program selection is attained, it is expected that whenever [hit / of a recommendation program] improves.

[0004] This invention aims at offering the record medium which recorded the program recommendation equipment whose program recommendation according to the taste property of program selection of a user is made in view of the above-mentioned situation, and is attained, the program recommendation approach, and its program.

[0005]

[Means for Solving the Problem] In order to attain this object, invention according to claim 1 is characterized by to have a user taste study means generate two or more profiles which profile attribute value was changed to arbitration and generated it, and a recommendation program decision means determine a recommendation program using two or more profiles generated by the user taste study means, according to the classification of the text of the program information slack EPG data of a television program.

[0006] Invention according to claim 2 is characterized by having further a recommendation program display means to display the recommendation program determined by the recommendation program decision means in invention according to claim 1.

[0007] An EPG data control means by which invention according to claim 3 has managed EPG data in invention according to claim 2, A race card display means to display a race card based on the EPG data managed by the EPG data control means, It has further a program reservation means to reserve the program specified as the user. A user taste study means The EPG data of the program in which the selection input was done by the user from the race card displayed by the race card display means, and the program inputted into the program reservation means by the user are acquired from an EPG data control means, and it is characterized by counting the frequency of occurrence of the text of the acquired EPG data.

[0008] It is characterized by invention according to claim 4 considering as the aggregate value from which a user taste study means differs the aggregate value of a profile according to the classification of a text in invention according to claim 2 or 3.

[0009] Invention according to claim 5 carries out that a recommendation program display means displays the list of the recommendation program which the user was made to choose whether it puts among the classification of a text, emphasis is put on what, and a recommendation program is determined in case the list of recommendation programs is displayed, and was determined by the recommendation program decision means using the profile according to selection in it in invention given in any 1 term of claims 2-4 as the description.

[0010] It is characterized by invention according to claim 6 presenting the text most contributed to the decision of a recommendation program for every one or plurality, and program in invention given in any 1 term of claims 2-5, in case a recommendation program display means displays the list of recommendation programs.

[0011] Invention according to claim 7 is characterized by using a program title for a user taste study means as a text classification of EPG data in invention given in any 1 term of claims 1-6.

[0012] Invention according to claim 8 is characterized by using a performer name for a user taste study means as a text classification of EPG data in invention given in any 1 term of claims 1-7.

[0013] Invention according to claim 9 is characterized by using the genre of a program for a user taste study means as a text classification of EPG data in invention given in any 1 term of claims 1-8.

[0014] Invention according to claim 10 is characterized by having the user taste study process which generates two or more profiles which profile attribute value was changed to arbitration and generated it, and the recommendation program decision process of determining a recommendation program using two or more profiles generated by the user taste study process, according to the classification of the text of the program information slack EPG data of a television program.

[0015] Invention according to claim 11 is characterized by having further the recommendation program display process which displays the recommendation program determined according to the recommendation program decision process in invention according to claim 10.

[0016] Invention according to claim 12 like the EPG data receiving tube science and engineering which receives and manages EPG data in invention according to claim 11 The race card display process which receives like EPG data receiving tube science and engineering, and displays a race card based on the EPG data managed, It has further the program reservation process which reserves the program specified as the user. A user taste study process The program in which the selection input was done by the user from the race card displayed by the race card display process, And the EPG data of a program inputted into the program reservation process by the user are received like EPG data receiving tube science and engineering, and it acquires from the managed EPG data constellation, and is characterized by counting the frequency of occurrence of the text of the acquired EPG data.

[0017] It is characterized by invention according to claim 13 considering as the aggregate value from which a user taste study process differs the aggregate value of a profile according to the classification of a text in invention according to claim 11 or 12.

[0018] In case a recommendation program display process displays the list of recommendation programs, invention according to claim 14 makes a user choose whether it puts among the classification of a text, emphasis is put on what, and a recommendation program is determined, and carries out displaying the list of the recommendation program determined according to the recommendation program decision process as the description using the profile according to selection in invention given in any 1 term of claims 11-13.

[0019] It is characterized by invention according to claim 15 presenting the text most contributed to the decision of a recommendation program for every one or plurality, and program in invention given in any 1 term of claims 11-14, in case a recommendation program display process displays the list of recommendation programs.

[0020] Invention according to claim 16 is characterized by using a program title for a

user taste study process as a text classification of EPG data in invention given in any 1 term of claims 10-15.

[0021] Invention according to claim 17 is characterized by using a performer name for a user taste study process as a text classification of EPG data in invention given in any 1 term of claims 10-16.

[0022] Invention according to claim 18 is characterized by using the genre of a program for a user taste study process as a text classification of EPG data in invention given in any 1 term of claims 10-17.

[0023] It carries out [that invention according to claim 19 performs user taste study processing which generates two or more profiles which profile attribute value was changed to arbitration and generated it, and recommendation program decision processing in which a recommendation program is determined using two or more profiles generated by user taste study processing, according to the classification of the text of the program information slack EPG data of a television program, and] as the description.

[0024] Invention according to claim 20 is characterized by performing further recommendation program display processing which displays the recommendation program determined by recommendation program decision processing in invention according to claim 19.

[0025] The EPG data reception management processing which invention according to claim 21 receives EPG data in invention according to claim 20, and is managed, Race card display processing which receives by EPG data reception management processing, and displays a race card based on the EPG data managed, Program reservation processing which reserves the program specified as the user is performed further. User taste study processing The program in which the selection input was done by the user from the race card displayed by race card display processing, And EPG data reception management processing receives the EPG data of a program inputted into program reservation processing by the user, and it acquires from the managed EPG data constellation, and is characterized by counting the frequency of occurrence of the text of the acquired EPG data.

[0026] It is characterized by invention according to claim 22 considering as the aggregate value from which user taste study processing differs the aggregate value of a profile according to the classification of a text in invention according to claim 20 or 21.

[0027] In invention given in any 1 term of claims 20-22, in case recommendation program display processing displays the list of recommendation programs, invention according to claim 23 makes a user choose whether it puts among the classification of a text, emphasis is put on what, and a recommendation program is determined, and carries out displaying the list of the recommendation program determined by recommendation program decision processing as the description using the profile

according to selection.

[0028] It is characterized by invention according to claim 24 presenting the text most contributed to the decision of a recommendation program for every one or plurality, and program in invention given in any 1 term of claims 20-23, in case recommendation program display processing displays the list of recommendation programs.

[0029] Invention according to claim 25 is characterized by user taste study processing using a program title as a text classification of EPG data in invention given in any 1 term of claims 19-24.

[0030] Invention according to claim 26 is characterized by user taste study processing using a performer name as a text classification of EPG data in invention given in any 1 term of claims 19-25.

[0031] Invention according to claim 27 is characterized by user taste study processing using the genre of a program as a text classification of EPG data in invention given in any 1 term of claims 19-26.

[0032]

[Embodiment of the Invention] First, the processing outline of this invention is explained using equipment configuration drawing of drawing 2 . The race card display means 121 displays a race card based on the EPG data managed in the EPG data control section 126. A race card is operated, a favorite program can be marked and a user can specify image transcription reservation of a program through the program reservation means 122.

[0033] The reserved program can be caught with the program which a user likes. Based on actuation of such a user, the user taste study means 123 finds out a user's favorite program, and registers into a user profile 129 the text set which disassembled the EPG data corresponding to the program into the text using the keyword dictionary 128. A user profile 129 is a table which uses the pair of a text and its frequency-of-occurrence count (profile value) as an element. A user profile 129 can be caught with the frequency table of the text showing a user's taste. It is set up so that a user profile may change an aggregate value [as opposed to / according to the class of text / a profile value (profile attribute value) in 129], and more than one are prepared according to the class.

[0034] Thus, the program expected that a user probably likes the recommendation program decision means 125 is recommended using the obtained user profile 129. The profile value of the text is acquired from a user profile 129 about each text of the text set which specifically disassembled into the text the EPG data which the EPG data control section 126 holds, and it asks for the total. It can be predicted as the program which a user likes, so that this total value is high. The recommendation program display means 124 displays those programs.

[0035] In conventional program recommendation equipment, the number of user profiles 129 was one. On the other hand, the point that this invention is preparing two

or more things to which it changed the profile aggregate value according to the class of text according to the class is the description of the 1st point. Here, classes are for example, a program title, a performer, a genre, etc. When the text registered into a profile belongs to the class, the profile aggregate value is made high. For example, a profile to which the profile aggregate value of the text belonging to a program title becomes high relatively compared with other texts is constituted. It becomes possible to calculate a recommendation program with emphasis on the class by this.

[0036] Moreover, the point which enables it to choose with emphasis on what a recommendation program list is displayed as the recommendation program display means 124 shows this invention to drawing 11 is the description of the 2nd point. For example, in choosing a recommendation program with emphasis on a program list, it calculates a recommendation program using the profile 129 which makes the profile aggregate value of a program title high among user profiles 129. Thereby, a user can choose with emphasis on what a recommendation program is acquired, and the program recommendation of him according to the property of program selection of a user is attained.

[0037] Furthermore, as shown in drawing 12 , the point of having shown the text most contributed to choosing a recommendation program for every recommendation program is the description of the 3rd point. Thereby, since a user can know by what kind of reason the recommendation program was chosen, actuation of a system is [become] easier to understand him to a user.

[0038] Hereafter, the gestalt of operation of this invention is explained to a detail, referring to an accompanying drawing. Drawing 1 is the hardware block diagram showing the configuration of the program recommendation equipment in the gestalt of operation of this invention. It acquires the EPG data contained in a broadcast wave, manages and stores them, and is equipped with a race card display function, a program recommendation function, etc. while image transcription playback of a program is possible for the configuration of the program recommendation equipment shown in drawing 1 by accumulating the image voice of the television broadcasting received and tuned in as digital AV data.

[0039] The program recommendation equipment shown in drawing 1 has a tuner 101, the EPG data acquisition section 102, the AV converter 103, a system controller 104, the EPG Management Department 105, the data storage 106, the AV converter 107, and the information-display section 108.

[0040] First, a tuner 101 tunes in a desired channel from the television broadcasting wave which received through the antenna. The EPG data acquisition section 102 extracts the EPG data contained in the tuned-in broadcast wave. In addition, the VBI (Vertical Blanking Interleave) method which inserts data in the Vertical Synchronizing signal of an analog television signal is learned as an approach of including EPG data in a television broadcasting wave.

[0041] The EPG Management Department 108 manages and stores the acquired EPG data. The EPG Management Department 108 may consist of CPUs contained in a system controller 104 using RAM in which direct access is possible, and may use secondary storage, such as a hard disk.

[0042] Moreover, the AV encoder 103 changes into digital AV data the image voice of the broadcast wave which the tuner 101 tuned in. What is necessary is just to use MPEG 2 widely used by digital broadcasting etc. as a format of digital data. The data storage 106 stores the digital AV data concerned at the time of a program image transcription. The data storage 106 consists of mass secondary storage, such as a hard disk.

[0043] Moreover, the AV decoder 107 decodes the digital AV data read from the data storage 106 to an image sound signal at the time of playback of the program recorded on videotape. The information-display section 108 displays the user interface screen to a user. Through the information-display section 108, a video signal is superimposed on a user interface screen and a program image, and is outputted eventually.

[0044] A control unit 109 inputs the actuation from a user into a system controller 104. What is necessary is for a control unit 109 just to consist of an infrared remote controller, its light sensing portion, or a whole case surface panel switch of this equipment. A system controller 104 performs the program which realizes a program image transcription regenerative function and the program recommendation function stated with the gestalt of this operation, and controls each above-mentioned hardware block.

[0045] In addition, in the gestalt of this operation, the configuration which compresses the image voice of a program into digital data, and is saved at the data storage 106 is described. It is also possible to constitute from a method which carries out an analog image transcription on the video tape represented by this point and VHS. Moreover, although aimed at analog television broadcasting as a broadcast wave, it is also possible to be aimed at the digital television broadcast by which broadcast is planned in Japan from now on.

[0046] Moreover, in the gestalt of this operation, the case where EPG data are contained in the broadcast wave is assumed. Broadcast waves, such as this point and the Internet, may be equipment which acquires EPG data through a different communication medium.

[0047] Drawing 2 is the software block diagram showing the configuration of the program recommendation equipment in the gestalt of this operation. The program recommendation equipment in the gestalt of this operation has the race card display means 121, the program reservation means 122, the user taste study means 123, the recommendation program display means 124, the recommendation program decision means 125, and the EPG data control section 126.

[0048] Drawing 3 is drawing showing the data field of EPG data. As shown in drawing

3 , EPG data consist of program explanation 146 which explained briefly the content of the genre 145 to which programs, such as the program title 141, the broadcasting hours 142 of a program, the broadcast channel 143 of a program, the performer 144 of a program, and a report and music, belong, and the program. Drawing 3 shows the content of each field about three programs.

[0049] The EPG data control section 126 manages the EPG data acquired from the broadcast wave. The race card display means 121 displays a race card on a user using the EPG data managed in the EPG data control section 126.

[0050] Drawing 4 is drawing showing an example of a race card. Like a newspaper TV section, an axis of abscissa is set as the broadcast channel shaft 162, and a race card 161 sets an axis of ordinate as the broadcast time-of-day shaft 163, and shows a program by the tabular format. A user can change freely the value of the broadcast channel shaft 162 or the broadcast time-axis 163, and can peruse the program in various channel and time amount. Furthermore, a favorite program can be marked using a race card, the program reservation means 122 can be interlocked with, a desired program can be specified, and the image transcription of a program can be reserved. Program reservation data are managed as program reservation information 127.

[0051] By preference, the user taste study means 123 learns liking of a user as the frequency of occurrence of the text contained in EPG data using the EPG data and the keyword dictionary 128 of those programs based on the program reservation [which was acquired from the information and the program reservation means 122 of a program] information 127 which the user inputted in the race card which the race card display means 121 displayed, and generates a user profile 129. A user profile 129 embraces to those with two or more, they embrace the class of text, and the study approach is changed.

[0052] The recommendation program decision means 125 determines the recommendation program according to liking of a user based on the information on a user profile 129. The recommendation program decision means 124 shows a user the determined recommendation program concerned as a recommendation program list. A user can peruse those recommendation programs and can do image transcription reservation of the program included in mind.

[0053] Actuation of the gestalt of this operation centering on actuation of the user taste study means 123 which serves as the description of this invention among the above software blocks, the recommendation program decision means 125, and the recommendation program display means 124 is explained below.

[0054] The user taste study means 123 performs decomposition processing to the text set which expresses the description of these EPG data for EPG data about each program in advance of program recommendation processing. The EPG vector of that program, a call, and decomposition processing are called generation processing of an

EPG vector for this text set.

[0055] <u>Drawing 6</u> is a flow chart which shows the procedure of EPG vector processing. Although the structure of EPG data is as <u>drawing 3</u> having shown, it decomposes the text information on the program explanation 146 into a word about the EPG data of a certain program using the morphological analysis which used the keyword dictionary 128 (step S201). Morphological analysis is processing which decomposes text information into a word with part-of-speech information according to a Japanese-grammar regulation, and is a technique widely used for sentential calculus processing, kana-kanji conversion processing, etc.

[0056] A common noun and a proper noun are regarded as a keyword of the program among the words decomposed by morphological analysis (step S202). Next, the keyword extracted by the program title 141, the performer 144, the genre 145, and step S202 of EPG data is used as an element, and the EPG vector Ei is constituted with the class, and let this be the EPG vector of the program (step S203). Repeat processing is performed from step S202 to step S203 until it processes all programs (steps S204/NO).

[0057] <u>Drawing 5</u> is drawing showing an example of an EPG vector. This example is the EPG vector of the program of the title the "classic concert" of <u>drawing 3</u> . The EPG vector consists of a "classic concert", a "MHK symphony orchestra", "music", and each class (a title 153, a performer 154, genre 155) 151 and the keyword 156 which extracted the program explanation 146 by morphological analysis further.

[0058] Next, the procedure which learns a user's taste in the user taste study means 123 is explained. The program of liking [a user], the marked program, and the program which the user reserved through the program reservation means 122 are inputted into the user taste study means 123 as a user's favorite program to the race card which the race card display means 121 displayed. The taste of a program is learned based on these favorite programs, and it is memorized as a user profile 129. Two or more user profiles 129 exist according to the property of learning taste.

[0059] <u>Drawing 7</u> is a flow chart which shows processing of the taste study in one user profile 129. First, the EPG vector Ei over a user's inputted favorite program is acquired (step S212). The EPG vector Ei is generated according to processing of the flow chart beforehand shown in <u>drawing 6</u> . The element of the EPG vector Ei is set into one ejection, and it is set to Vj (step S213).

[0060] Next, Vj judges whether it is the element of the class specified as the user (step S214). In the case of the class by which the profile was specified that it learns more strongly among the classes (it sets in the gestalt of this operation and they are a title 153, a performer 154, and a genre 155) of j, (steps S214/YES) and the aggregate value Wj of the study to Vj are set as WF (step S215).

[0061] In step S214, when it is not a class specified by a user, (steps S214/NO) and the aggregate value Wj of the study to Vj are set as WN (step S216). Here, it considers

as WF>WN.

[0062] Next, Wj is added to the profile value Pk of Vj in Profile Pk [Vj] (step S217). It carries out until all Vj(s) end processing from the above step S213 to step S217 (steps S217/YES).

[0063] Drawing 9 is drawing showing the content immediately after learning the EPG vector of drawing 5 from the condition (all profile values being 0) of learning no program titles in the profile specified that it learns strongly. Here, it is referred to as WN=1 and WF=10. In addition, the profile value of the other element is 1 [equal to the value of WN] 10 with the profile value of the "classic concert" which is a program title as the value of WF is shown in drawing 9 equal to the value of WF.

[0064] In addition, although there are only two kinds, 1 and 10, in the profile value in drawing 9 , as I have the sequence of an item of thinking as important to a user chosen, for example, it was called 1, 2, 4, and 8, it is good also as a profile value to which weighting was changed gradually.

[0065] Thus, a user profile 129 holds the accumulation count (profile value) of a text which writes the EPG vector of the program which a user likes, i.e., the description of a program. In the case of the text class as which the user profile 129 was specified, by making a profile aggregate value increase, it is set up so that the class may be learned strongly.

[0066] Drawing 10 is drawing showing an example of a user profile 129. As shown in drawing 10 , 131, 132, 133, and the profile 134 that learns every class similarly further are prepared for every one profile which learns it strongly about each of a program title, a performer, and a genre.

[0067] Next, the procedure of determining the recommendation program to which the recommendation program decision means 125 met a user's taste based on the user profile 129 is explained. Here, a means to determine a recommendation program from one profile in a user profile 129 is explained. It is processed with a recommendation program display means 125 to mention later whether a recommendation program is determined using which profile and the result is shown to a user.

[0068] Drawing 8 is a flow chart which shows the procedure of determining a recommendation program using one profile Pk. First, 0 is substituted for the assessment value PRi of whenever [ejection and recommendation / of the program] for the EPG vector Ei over one program in the program group for recommendation (step S222). The element of the EPG vector Ei is set into one ejection, and it is set to Vj (step S223). It confirms whether the profile value over the text of Vj exists in Profile Pk (step S224). If a profile value exists (steps S224/YES), the value Pk [Vj] will be added to the assessment value PRi (step S225).

[0069] In step S224, if a profile value does not exist (steps S24/NO), the above-mentioned addition processing is not performed. From step S223 to the step S225 is repeatedly processed until all the elements of Ei are completed (steps

S226/YES).

[0070] From step S222 to the step S226 is repeatedly processed about a program until all the program groups for recommendation are completed (steps S227/YES). Thus, the assessment value PRi of whenever [recommendation] is calculated about all the programs of the program group for recommendation. Finally, PRi is sorted to descending and the n high orders are made into a recommendation program (step S228). n should just specify the maximum number in a program recommendation display for ten etc. pieces etc.

[0071] In the EPG vector containing a text with the high profile value in Profile Pk, by processing shown in drawing 8 , the assessment value PRi of whenever [recommendation] becomes high. In order that Profile Pk may show the frequency of occurrence of the text contained in the program which a user likes, it will have chosen the program which matches from the program in which a user likes the higher program of PRi in the viewpoint of the content of a text of EPG data.

[0072] Above-mentioned user taste study and the procedure of program recommendation are based on the very simple approach of the accumulation of the frequency of occurrence of a text. However, it is not limited to this approach but technique, such as Bayes estimation widely used by pattern recognition, text matching, etc. as more advanced procedure, may be used.

[0073] Next, processing of a recommendation program display means 124 to show a user the acquired recommendation program is explained. In the gestalt of this operation, the user profile 129 consists of four profiles to which the strength of study was changed according to the element class of EPG vector as shown in drawing 10 .

[0074] The recommendation program display means 124 has become as [choose / it / whether which profile is used for a user and a recommendation program is acquired]. When it follows, for example, a recommendation program is determined using "user profile which learns program title strongly" 131, "a recommendation program with emphasis on a program title" will be acquired. It is thought that the basis of selection at the time of a user choosing a program is generally various. It is thought that there is a basis of selection, such as thinking as important and choosing the performer who thinks as important and chooses a title, and it can be expected that the program recommendation with a more high precision is attained with emphasis on what a user acquires a recommendation program because a user specifies clearly.

[0075] Drawing 11 , drawing 12 , and drawing 13 are drawings having shown an example of the recommendation program list screen which the recommendation program display means 124 displays. Drawing 11 is a display when a user chooses the item 171 of "choosing a title as importance" in the recommendation program list screen 170. Based on "user profile which learns program title strongly" 131, the recommendation program is acquired and displayed using the recommendation program decision means 125. The information on each recommended program is displayed on the chart with

the program title train 175, the channel train 176, the broadcasting-hours train 177, and the genre train 178.

[0076] <u>Drawing 12</u> is another example of a configuration of a recommendation program list screen, and, as for the list screen 180, the keyword train 179 is added as compared with the list screen 170 of <u>drawing 11</u> . this screen is a screen when a user chooses 174 "come [leave and] out of and chosen." Based on "user profile which learns every class by same strength" 134, the recommendation program is acquired and displayed using the recommendation program decision means 125. In each recommended program, a text with the highest profile value of the user profile (in this case, "user profile which learns every class by same strength" 134) used for obtaining that recommendation among the texts of the EPG vector corresponding to that program is displayed on the keyword train 179. That is, this text is a text most contributed to obtaining that recommendation, and a user can understand the reason for having chosen that program by showing a user it.

[0077] <u>Drawing 13</u> is still more nearly another example of a configuration of a recommendation program list screen, and, as for the list screen 190, the content display 191 of a program is added as compared with the list screen 180 of <u>drawing 12</u> . The content display 191 of a program displays the content of a program about the program which the selection cursor 192 has hit. Thereby, a user can know the content of a recommendation program easily, and can judge easily whether he wants to see truly.

[0078] Moreover, in <u>drawing 11</u> , <u>drawing 12</u> , and each <u>drawing 13</u> , one of the recommendation programs by which it was indicated by the list can be chosen, and image transcription reservation of it can also be carried out through the image transcription reservation means 122.

[0079] The program recommendation approach explained above can be performed by the program. A magnetic-recording medium, an optical recording medium, or a semi-conductor record medium is recorded and provided with the program concerned, or it is downloaded through a network by the file transfer protocol (FTP).

[0080] In addition, the gestalt of operation mentioned above shows an example of the gestalt of suitable operation of this invention, and deformation implementation is variously possible for this invention within limits which do not deviate from the summary, without being limited to this.

[0081]

[Effect of the Invention] The 1st effectiveness of this invention is the point which can calculate a recommendation program with emphasis on each class of the text which constitutes EPG data so that clearly from the above explanation. The reason is that it is preparing two or more user profiles to which the aggregate value was changed according to the text class of EPG data in study of user taste.

[0082] The 2nd effectiveness is a point whose program recommendation according to

the property of program selection of a user is attained. The reason is realizable by choosing a predetermined profile out of two or more user profiles to which the user changed the strength of study in with emphasis on what a recommendation program is acquired.

[0083] The 3rd effectiveness is a point which becomes possible [clarifying the reason for recommendation and showing it]. In case the reason presents a recommendation program, it is from showing simultaneously the text most contributed to the recommendation.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the hardware block diagram showing the configuration of the program recommendation equipment in the gestalt of operation of this invention.

[Drawing 2] It is the software block diagram showing the configuration of the program recommendation equipment in the gestalt of this operation.

[Drawing 3] It is drawing showing the data field of EPG data.

[Drawing 4] It is drawing showing an example of a race card.

[Drawing 5] It is drawing showing an example of an EPG vector.

[Drawing 6] It is the flow chart which shows the procedure of EPG vector processing.

[Drawing 7] It is the flow chart which shows processing of the taste study in one user profile.

[Drawing 8] It is the flow chart which shows the procedure of determining a recommendation program using one profile Pk.

[Drawing 9] It is drawing having shown an example of the profile value for every text.

[Drawing 10] It is drawing showing an example of a user profile.

[Drawing 11] It is drawing having shown an example of a recommendation program list screen.

[Drawing 12] It is drawing having shown an example of a recommendation program list screen.

[Drawing 13] It is drawing having shown an example of a recommendation program list screen.

[Description of Notations]

101 Tuner

102 EPG Data Acquisition Section

103 AV Converter

104 System Controller

105 EPG Management Department

106 Data Storage

107 AV Decoder

108 Information-Display Section

109 Control Unit

121 Race Card Display Means

122 Program Reservation Means

123 User Taste Study Means

124 Recommendation Program Display Means

125 Recommendation Program Decision Means

126 EPG Data Control Section

127 Program Reservation Information

128 Keyword Dictionary

129 User Profile